

# Section 7.1

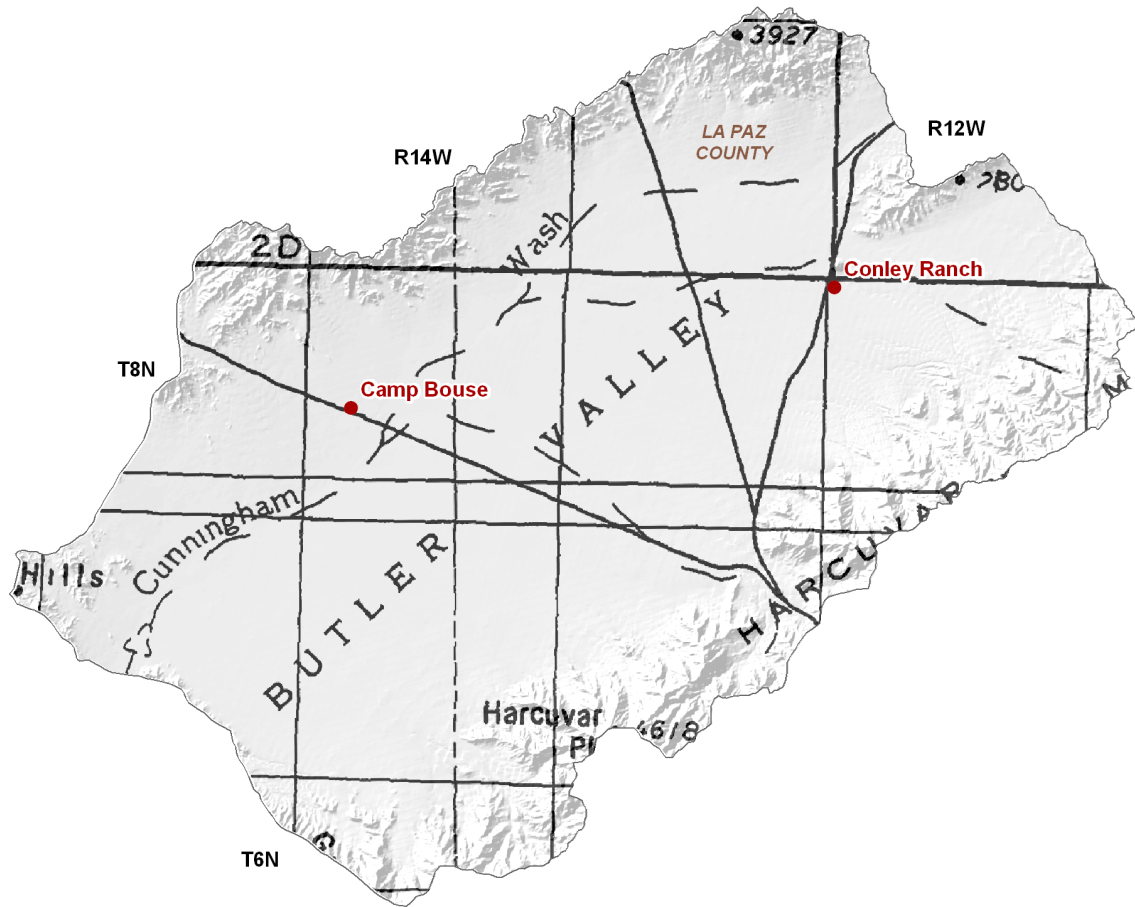
## Butler Valley Basin



### 7.1.1 Geography of the Butler Valley Basin

The Butler Valley Basin, located in the northern part of the planning area, is 288 square miles in area. Geographic features and principal places are shown on Figure 7.1-1. The basin is characterized by a valley bordered by two mountain ranges. Vegetation types include Lower Colorado River Valley and Arizona Uplands Sonoran desertscrub and a small amount of southwestern interior chaparral on the eastern basin boundary. (See Figure 7.0-7)

- Principal geographic features shown on Figure 7.1-1 are:
  - Basin places of Camp Bouse and Conley Ranch
  - Cunningham Wash running northeast to southwest in the northern portion of the basin
  - Butler Valley bordered by the Harcuvar Mountains on the eastern basin boundary and the Buckskin Mountains on the northwestern basin boundary
  - Harcuvar Peak at 4,618 feet, the highest point in the basin
- Not well shown on the map is the lowest point in the basin 1,345 feet at the “Narrows” where Cunningham Wash exits the basin.



Base Map: USGS 1:500,000, 1981

0 3 6 Miles



City, Town or Place



**Figure 7.1-1**  
**Butler Valley Basin**  
**Geographic Features**

### **7.1.2 Land Ownership in the Butler Valley Basin**

Land ownership, including the percentage of ownership by category, for the Butler Valley Basin is shown in Figure 7.1-2. Principal features of land ownership in this basin are the large blocks of U.S. Bureau of Land Management and State Trust lands. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of largest to smallest percentage in the basin.

#### **U.S. Bureau of Land Management (BLM)**

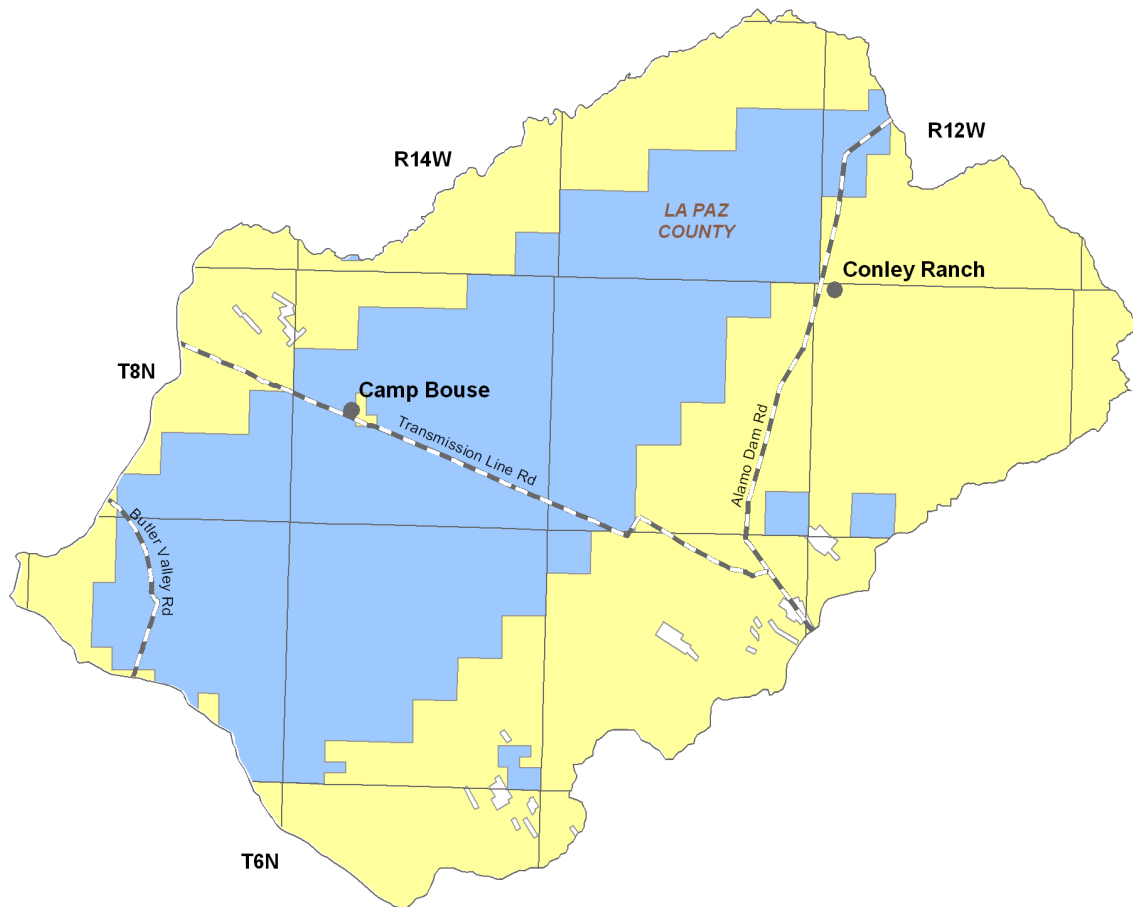
- 55.5% of the land is federally owned and managed by the Yuma Field Office of the Bureau of Land Management.
- BLM land in this basin includes 4,900 acres of the 38,000 acre Rawhide Mountains Wilderness and 11,000 acres of the 25,000 acre Harcuvar Mountains Wilderness. (See Figure 7.0-9)
- Land uses include grazing, resource conservation and recreation.

#### **State Trust Land**

- 43.9% of the land is held in trust for the public schools, state charitable penal reform and county bonds under the State Trust Land system.
- Primary land use is grazing.

#### **Private**

- 0.6% of the land is private.
- Small parcels of private land are found surrounded by BLM land in the northern and southern portions of the basin.
- Land uses include domestic and ranching.



Source: ALRIS, 2004

0 3 6 Miles



**Figure 7.1-2  
Butler Valley Basin  
Land Ownership**

**Land Ownership  
(Percentage in Basin)**

U.S. Bureau of Land Management (55.5%)

State Trust (43.9%)

Private (0.6%)

Major Road

City, Town or Place



### 7.1.3 Climate of the Butler Valley Basin

The Butler Valley Basin does not contain NOAA/NWS, Evaporation Pan, AZMET or SNOTEL/Snowcourse stations. Figure 7.1-3 shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

#### SCAS Precipitation Data

- See Figure 7.1-3
- Average annual rainfall is as high as 18 inches along the central eastern basin boundary and as low as six inches in the central western portion of the basin.

**Table 7.1-1 Climate Data for the Butler Valley Basin**

#### A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
None									

Source: WRCC, 2003

#### B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
None			

Source: WRCC, 2003.

#### C. AZMET:

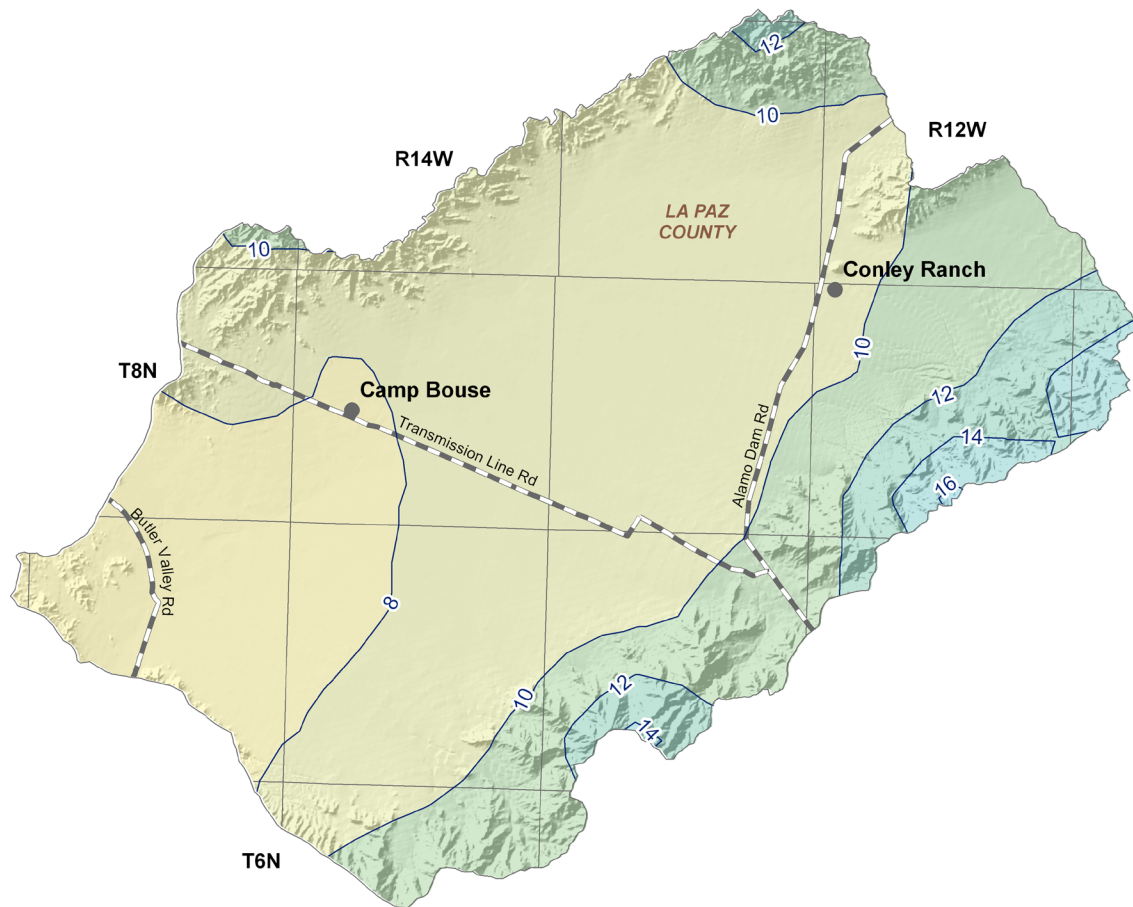
Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evapotranspiration, in inches (Number of years to calculate averages)
None			

Source: Arizona Meteorological Network, 2005

#### D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Snowpack, at Beginning of the Month, as Inches Snow Water Content (Number of measurements to calculate average)					
			Jan.	Feb.	March	April	May	June
None								

Source: NRCS, 2005



**Average Annual  
Precipitation  
(1961-1990)**  
inches per year



Precipitation Contour  
Major Road  
City, Town or Place



0 3 6  
Miles



**Figure 7.1-3  
Butler Valley Basin  
Meteorological Stations and  
Annual Precipitation**



Precipitation Data Source: Oregon State  
University, 1998

#### **7.1.4 Surface Water Conditions in the Butler Valley Basin**

There are no streamflow data, flood ALERT equipment or USGS runoff contour data available for this basin. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 7.1-4. The location of large reservoirs is shown on Figure 7.1-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

##### **Reservoirs and Stockponds**

- Refer to Table 7.1-4.
- The basin contains one large reservoir, Cunningham Wash, with a maximum surface area of 143 acres. Its use was not available.
- There are no small reservoirs and seven registered stockponds in this basin.



Table 7.1-2 Streamflow Data for the Butler Valley Basin

Station Number	USGS Station Name	Drainage Area (in mi <sup>2</sup> )	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
None													

Sources: USGS NWIS, USGS 1998 and USGS 2003.

**Table 7.1-3 Flood ALERT Equipment in the Butler Valley Basin**

Station ID	Station Name	Station Type	Install Date	Responsibility
None				

**Table 7.1-4 Reservoirs and Stockponds in the Butler Valley Basin**

**A. Large Reservoirs (500 acre-feet capacity and greater)**

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM STORAGE (AF)	USE	JURISDICTION
None identified by ADWR at this time					

**B. Other Large Reservoirs (50 acre surface area or greater)**

MAP KEY	RESERVOIR/LAKE NAME (Name of dam, if different)	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE	JURISDICTION
1	Cunningham Wash	NA	143	NA	Private

**C. Small Reservoirs (greater than 15 acre-feet and less than 500 acre-feet capacity)**

Total number: 0

Total maximum storage: 0 acre-feet

**D. Other Small Reservoirs (between 5 and 50 acres surface area)**

Total number: 0

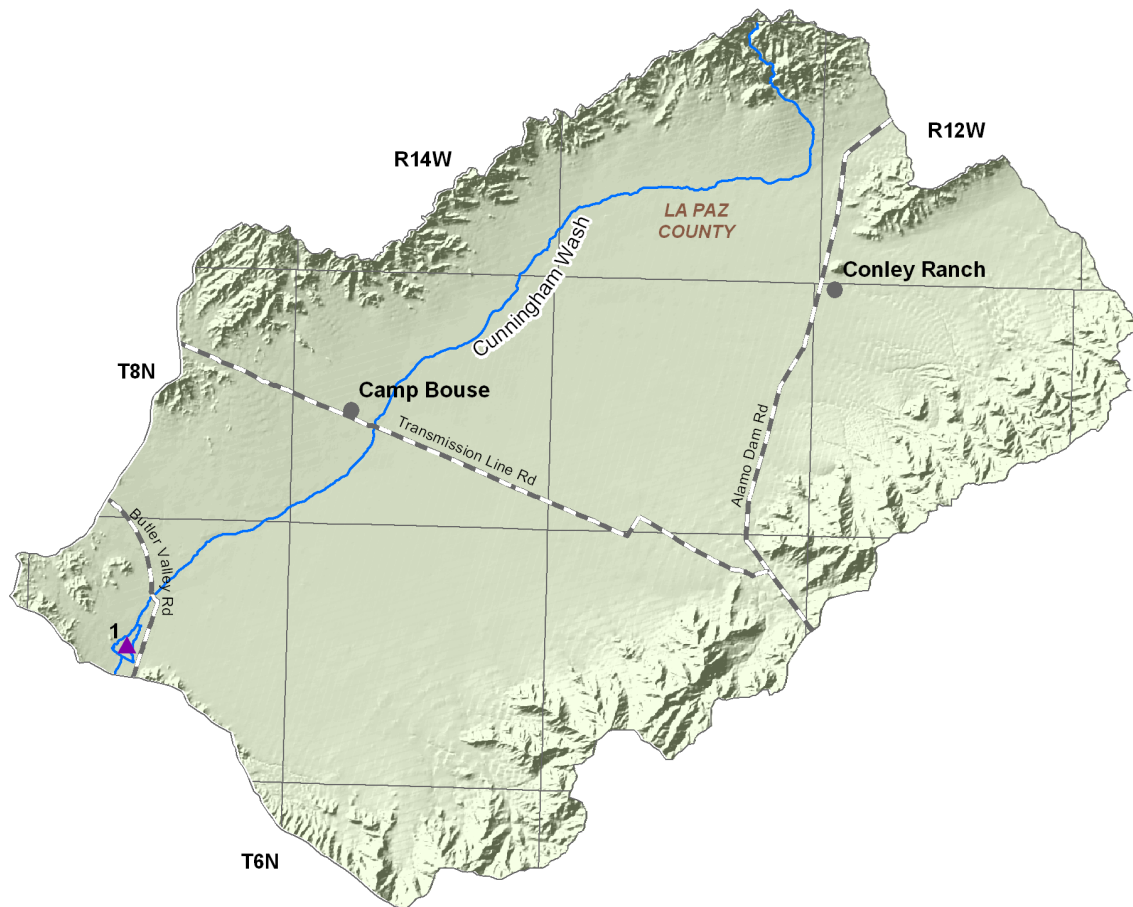
Total surface area: 0 acres

**E. Stockponds (up to 15 acre-feet capacity)**

Total number: 7

**Notes:**

NA = Information is not available to ADWR at this time







Stream Data Source: ALRIS, 2005

0 3 6  
Miles



**Figure 7.1-4**  
**Butler Valley Basin**  
**Surface Water Conditions**

- Large Reservoir 
- Stream Channel (width of line reflects stream order) 
- Major Road 
- City, Town or Place 

### 7.1.5 Perennial/Intermittent Streams and Major Springs in the Butler Valley Basin

The total number of springs in the basin are shown in Table 7.1-5. There are no perennial or intermittent streams and no major or minor springs in the Butler Valley Basin. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- The total number of springs, regardless of discharge, identified by the USGS is one.

**Table 7.1-5 Springs in the Butler Valley Basin**

**A. Major Springs (10 gpm or greater):**

Map Key	Name	Location		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
None identified by ADWR at this time					

**B. Minor Springs (1 to 10 gpm):**

Name	Location		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
None identified by ADWR at this time				

**C. Total number of springs, regardless of discharge, identified by USGS**  
(see ALRIS, 2005 and USGS, 2006): 1

## 7.1.6 Groundwater Conditions of the Butler Valley Basin

Major aquifers, well yields, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 7.1-6. Figure 7.1-5 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 7.1-6 contains hydrographs for selected wells shown on Figure 7.1-5. Figure 7.1-7 shows well yields in four yield categories. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

### Major Aquifers

- Refer to Table 7.1-6 and Figure 7.1-5.
- The major aquifer is basin fill.
- Flow direction is from northeast to southwest generally following Cunningham Wash.

### Well Yields

- Refer to Table 7.1-6 and Figure 7.1-7.
- As shown on Figure 7.1-7, well yields generally range from 1,000 gallons per minute (gpm) to greater than 2,000 gpm.
- One source of well yield information, based on 17 reported wells, indicates that the median well yield is 2,200 gpm.

### Natural Recharge

- Refer to Table 7.1-6.
- There are two estimates of natural recharge ranging from less than 1,000 acre-feet per year to 1,060 acre-feet per year.

### Water in Storage

- Refer to Table 7.1-6.
- There are five estimates of water in storage ranging from two million acre-feet at a depth of 1,200 feet to 20 million acre-feet at a depth of 1,000 feet.

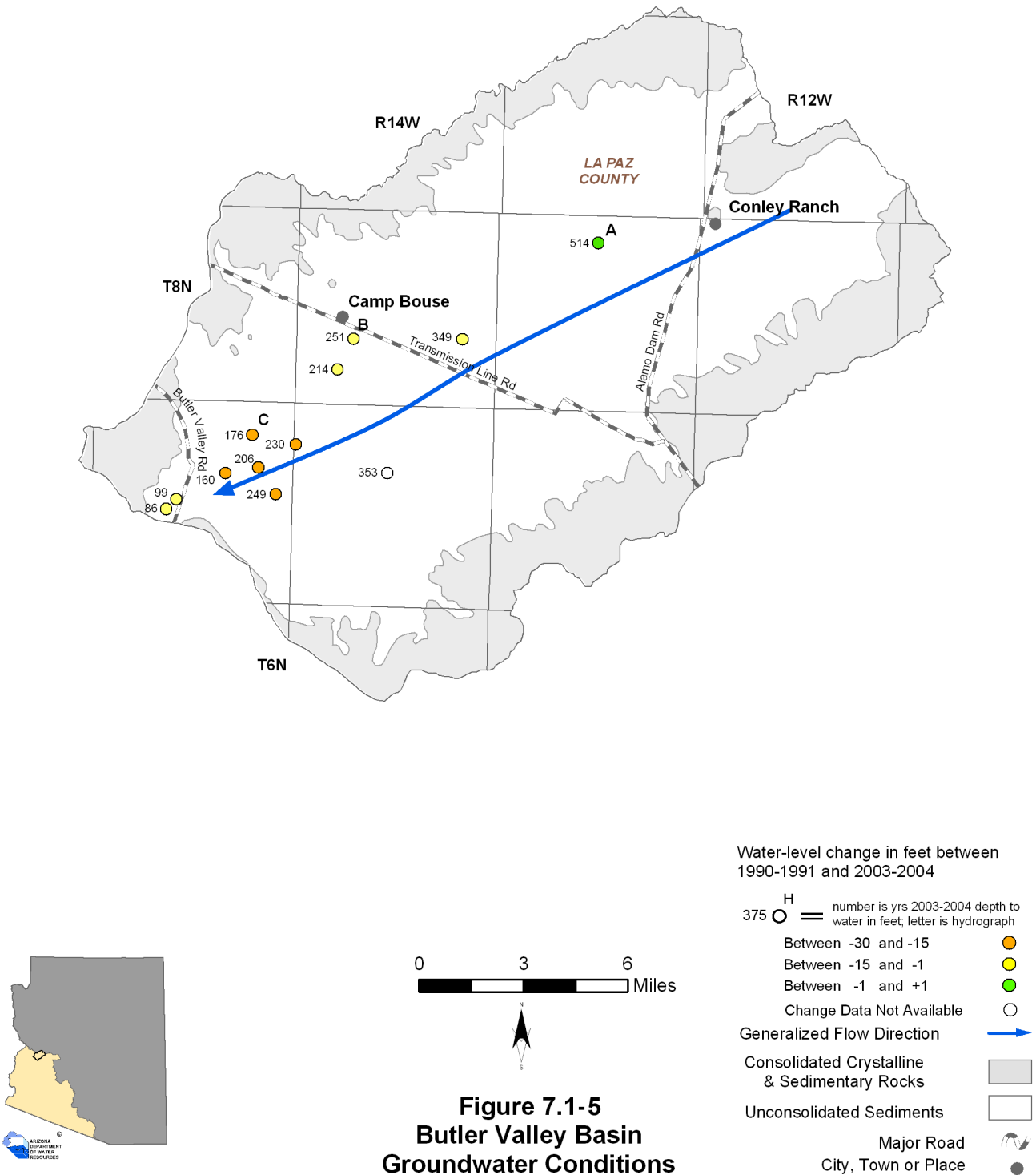
### Water Level

- Refer to Figure 7.1-5. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures thirteen index wells in this basin, hydrographs for three index wells are shown on Figure 7.1-6.
- The deepest water level shown on the map is 514 feet west of Conley Ranch and the shallowest water level shown on the map is 86 feet near the southwestern basin boundary.

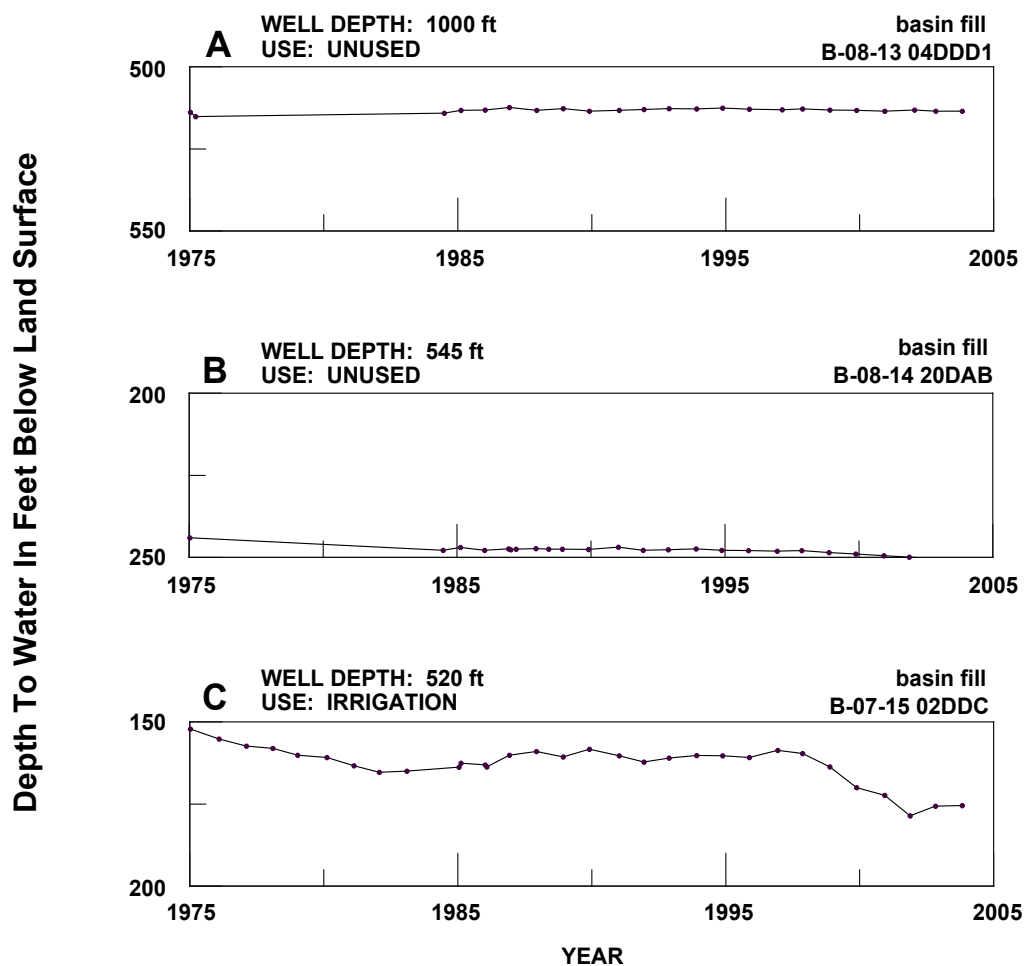
**Table 7.1-6 Groundwater Data for the Butler Valley Basin**

<b>Basin Area, in square miles:</b> 288		
<b>Major Aquifer(s):</b>	<b>Name and/or Geologic Units</b>	
	Basin Fill	
<b>Well Yields, in gal/min:</b>	Range 15.6-2,910 Median 1590 (5 wells measured)	Measured by ADWR and/or USGS
	Range 100-3,200 Median 2,200 (17 wells reported)	Reported on registration forms for large (> 10-inch) diameter wells
	Range 300-1,000	ADWR (1990)
	Range 0-2,500	USGS (1994)
<b>Estimated Natural Recharge, in acre-feet/year:</b>	<1,000	Freethy and Anderson (1986)
	1,060	Herndon (1985)
<b>Estimated Water Currently in Storage, in acre-feet:</b>	6,400,000 - 6,500,000 (to 1,200 ft)	ADWR (1990 and 1994)
	2,000,000 <sup>1</sup> (to 1,200 ft)	Freethy and Anderson (1986)
	5,000,000 (to 1,200 ft)	Arizona Water Commission (1975)
	12,000,000 (to 700 ft)	Herndon (1985)
	20,000,000 (to 1,000 ft)	USBR (1979)
<b>Current Number of Index Wells:</b> 13		
<b>Date of Last Water-level Sweep:</b> 2004 (24 wells measured)		

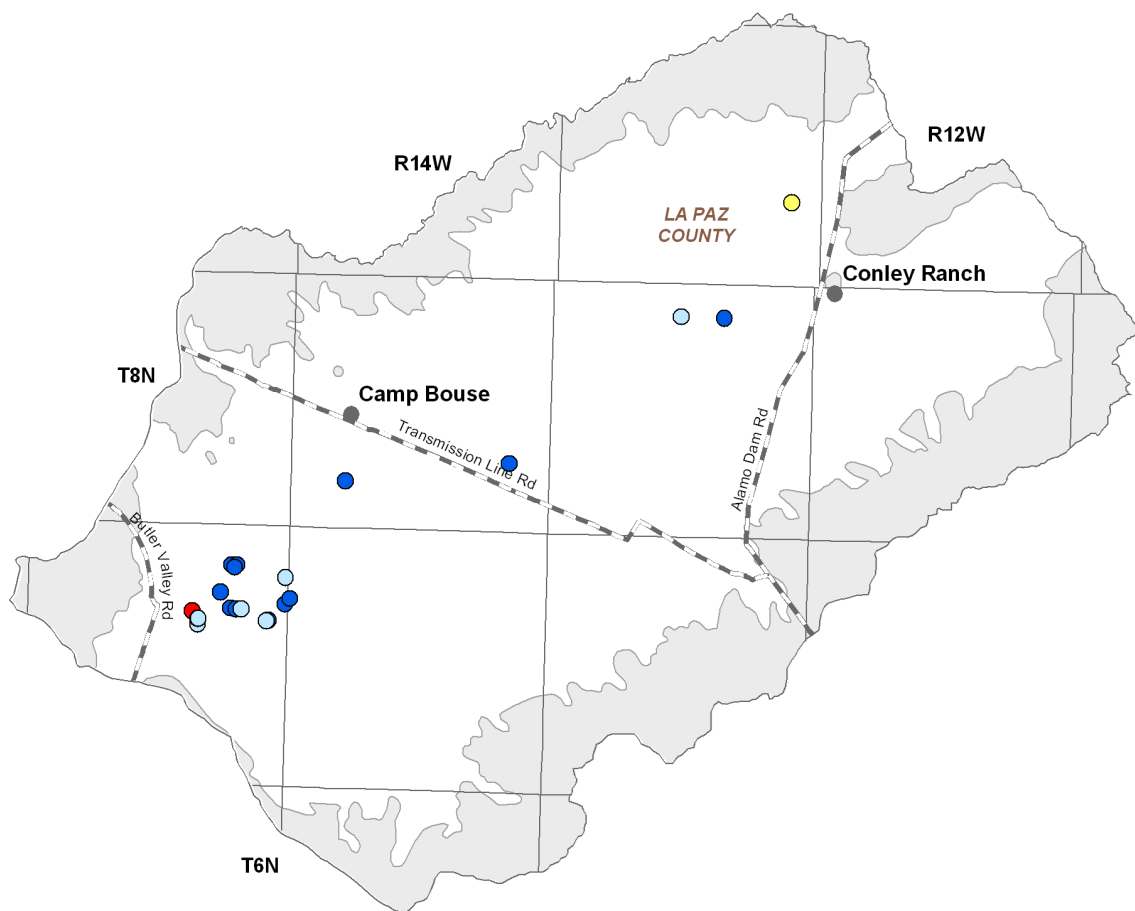
<sup>1</sup>Predevelopment Estimate



**Figure 7.1-6**  
**Butler Valley Basin**  
**Hydrographs Showing Depth to Water in Selected Wells**







0 3 6  
Miles



**Figure 7.1-7  
Butler Valley Basin  
Well Yields**

**Well Yields**

Greater than 2000 gals/min



Between 1000 and 2000 gals/min



Between 100 and 500 gals/min



Less than 100 gals/min



Consolidated Crystalline  
& Sedimentary Rocks



Unconsolidated Sediments



Major Road



City, Town or Place



## 7.1.7 Water Quality of the Butler Valley Basin

Wells, springs and mine sites with parameter concentrations that have equaled or exceeded drinking water standard(s), including location and parameter(s) are shown in Table 7.1-7A. There are no impaired lakes or streams in this basin. Figure 7.1-8 shows the location of water quality occurrences keyed to Table 7.1-7. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

### Wells, Springs and Mine Sites

- Refer to Table 7.1-7A.
- Eight wells have parameter concentrations that have equaled or exceeded drinking water standards.
- The parameter most frequently equaled or exceeded was fluoride.
- Other parameters equaled or exceeded include arsenic, lead and nitrates.

**Table 7.1-7 Water Quality Exceedences in the Butler Valley Basin<sup>1</sup>**

#### A. Wells, Springs and Mines

Map Key	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS) <sup>2</sup>
		Township	Range	Section	
1	Well	8 North	14 West	20	As, F
2	Well	8 North	14 West	29	As, F, Pb
3	Well	7 North	15 West	2	F
4	Well	7 North	15 West	10	F
5	Well	7 North	15 West	12	As
6	Well	7 North	15 West	13	As
7	Well	7 North	15 West	15	F
8	Well	7 North	15 West	15	F, NO3

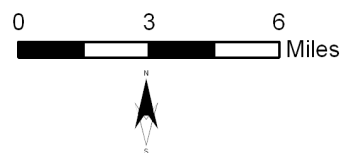
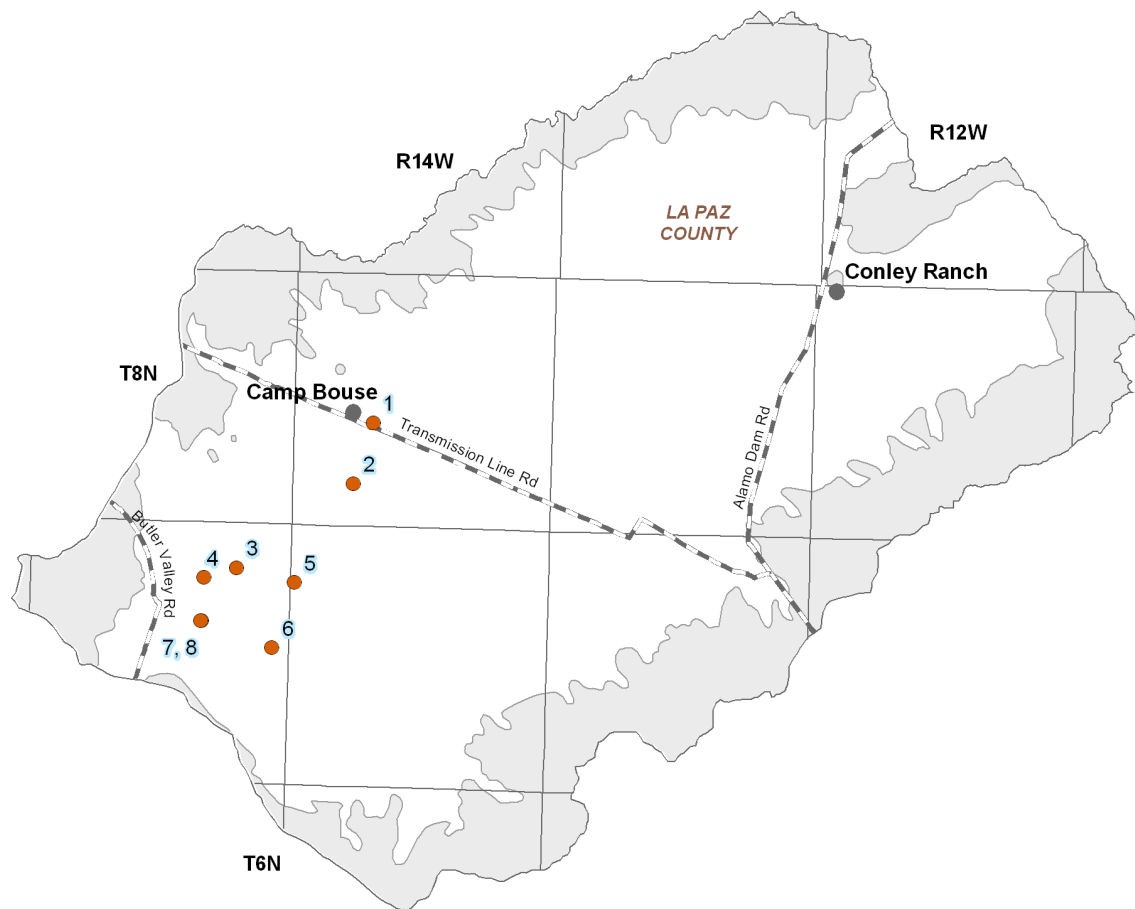
#### B. Lakes and Streams

Map Key	Site Type	Site Name	Length of Impaired Stream Reach (in miles)	Area of Impaired Lake (in acres)	Designated Use Standard	Parameter(s) Exceeding Use Standard
None identified by ADWR at this time						

#### Notes:

<sup>1</sup> Water quality samples collected between 1979 and 1998.

<sup>2</sup> As = Arsenic  
NO3 = Nitrate/ Nitrite  
F = Fluoride  
Pb = Lead



**Figure 7.1-8  
Butler Valley Basin  
Water Quality Conditions**

Well, Spring or Mine Site that has  
Equalled or Exceeded DWS

Consolidated Crystalline  
& Sedimentary Rocks

Unconsolidated Sediments

Major Road

City, Town or Place



### **7.1.8 Cultural Water Demands in the Butler Valley Basin**

Cultural water demand data including population, number of wells and the average well pumpage and surface water diversions by the municipal, industrial and agricultural sectors are shown in Table 7.1-8. Figure 7.1-9 shows the location of demand centers. There is no recorded effluent generation in this basin. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 7.0.7.

#### **Cultural Water Demands**

- Refer to Table 7.1-8 and Figure 7.1-9.
- Population in this basin is very small, with 18 residents in 2000. Projections suggest a small increase in population through 2050.
- There are no surface water diversions in this basin.
- Most cultural water use is for irrigation east of Butler Valley Road in the southwestern portion of the basin. Agricultural water use increased 150% from 1991-2003 with 8,700 acre-feet of demand per year on average from 2000 to 2003.
- Municipal water demand is minimal and did not increase from 1991 to 2003.
- As of 2003 there were 20 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 20 wells with a pumping capacity of more than 35 gallons per minute.

Table 7.1-8 Cultural Water Demands in the Butler Valley Basin<sup>1</sup>

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)						Data Source
				Well Pumpage			Surface-Water Diversions			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation	Municipal	Industrial	Irrigation	
1971		20 <sup>2</sup>	16 <sup>2</sup>	4,000			NR			ADWR (1994)
1972										
1973				4,000			NR			
1974										
1975				4,000			NR			
1976										
1977				4,000			NR			
1978										
1979		0	1	4,000			NR			
1980	5									
1981	6			4,000			NR			
1982	6									
1983	6			4,000			NR			
1984	7									
1985	8	0	1	4,000			NR			
1986	8									
1987	8			4,000			NR			
1988	9									
1989	10									
1990	10	0	1	<300			NR			USGS (2005)
1991	11									
1992	12			<300			NR			
1993	12									
1994	13			<300			NR			
1995	14									
1996	15	0	1	<300			NR			
1997	16									
1998	16			<300			NR			
1999	17									
2000	18									
2001	19	0	0	<300			NR			
2002	20									
2003	21			<300			NR			
2010	28									
2020	38			<300			NR			
2030	48									
2040	58	<300			NR					
2050	68									

**WELL TOTALS:**      **20**      **20**

<sup>1</sup> Does not include evaporation losses from stockponds and reservoirs.

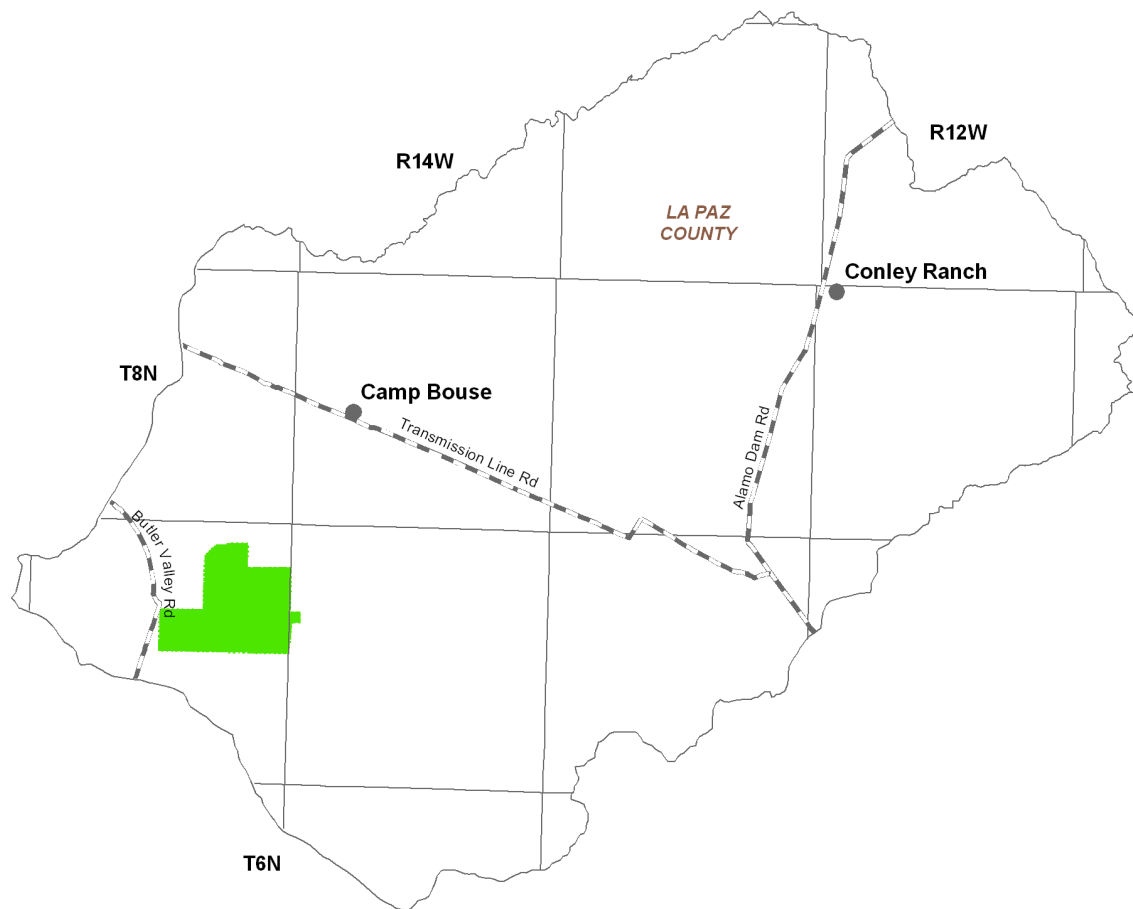
<sup>2</sup> Includes all wells through 1980.

<sup>3</sup> Data not available for 1991-1993, average shown is 1994-1995

NR - Not reported

Table 7.1-9 Effluent Generation in the Butler Valley Basin

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method						Current Treatment Level	Population Not Served	Year of Record
					Water-course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility			
No Waste Water Treatment Facilities Identified by ADWR in this Basin													



Primary Data Source: USGS National  
Gap Analysis Program, 2004

0 3 6  
Miles



**Figure 7.1-9**  
**Butler Valley Basin**  
**Cultural Water Demand**

**Demand Centers**

Agriculture



Major Road



City, Town or Place



### 7.1.9 Water Adequacy Determinations in the Butler Valley Basin

No water adequacy applications for the Butler Valley Basin were filed with the Department as of May 2005. A description of the Water Adequacy Program is found in Volume 1, Appendix A. Adequacy determination data sources and methods are found in Volume 1, Section 1.3.1.

**Table 7.1-10 Adequacy Determinations in the Butler Basin**

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section						
None identified by ADWR at this time											



# Butler Valley Basin

## References and Supplemental Reading

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